Gray Des. Div.
5/17/49 - Gift

DESIGN

RETURN TO
DESIGN DIV.

TRUSCON

FERROBORD

for 7.3 Floors and Roofs

PATENT OFFICE
JUL 15 1949
DESIGN DIVISION

■

A folder giving technical data and loading tables of Truscon Ferrobord in floor and roof constructions. All data are based on facts and fundamental principles from which approved building designs are developed.

New York City recently revised its Building Code. Their Board of Standards and Appeals performed load tests on this type of material and as a result gave their unanimous approval to its use as a roof decking in New York City under conditions of meeting the specifications of the individual projects.

The Federal Emergency Administration of Public Works at Washington, D. C. advises that their fire resistive requirements will include the use of steel deck roofs on schools provided the ceiling protection of the supporting incombustible members meets their requirements.

PATENT OFFICE
JUL 15 1949
DESIGN DIVISION

■

LIBRARY
MAY 23 1949
U S PATENT OFFICE

Issued December, 1938

RETURN TO
DESIGN DIV.

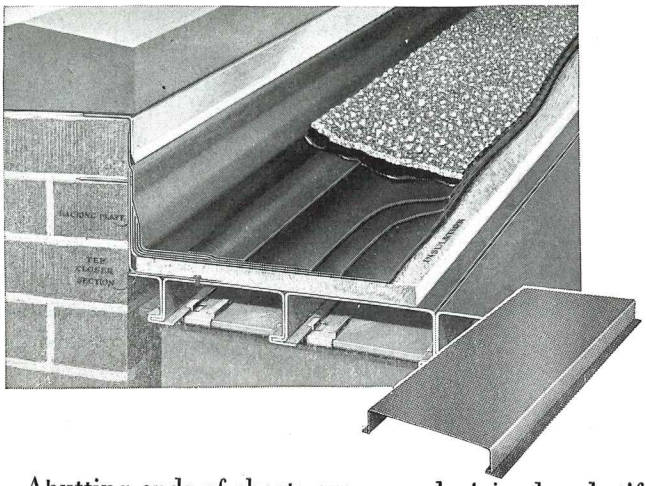
TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO

Sales Offices and Warehouses in Principal Cities

SUBSIDIARY: REPUBLIC STEEL CORPORATION

STEELDECK ROOFS

STEELDECK Roofs, insulated to any degree of efficiency and waterproofed, are of a broad and general usefulness. They are particularly adaptable to theatres, gymnasiums, schools, auditoriums, public halls and industrial buildings requiring large floor areas free from supports and obstructions. Steeldecks are strips of copper-bearing steel of standardized lengths and widths, with ribs formed longitudinally in the plates. The ribs are on the underside of the plates and the top is a smooth level surface to receive insulation and waterproofing. They can be used to advantage on straightway, flat, pitched and curved roofs (minimum radius of 60 ft.).



FERROBORD ROOF

The Ferrobord type of Truscon Steeldeck is a roof so formed that each sheet firmly interlocks with the adjoining sheets to form a continuous deck over the entire roof.

Truscon Ferroboard can be formed of either 18 or 20 gauge copper bearing or electro-galvanized strip steel. Each sheet is 6 in. wide with vertical flanges along the sides.

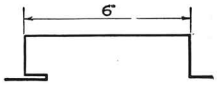
Ferrobord is applied directly to the roof supporting steel and is securely fastened to the structural members either by clipping or by welding each vertical rib to the purlins.

Abutting ends of sheets are securely joined and stiffened by a butt joint clip, presenting a smooth surface to which the insulation and built-up roofing are applied.

Ferrobord is adaptable to flat or pitched roofs or curved roofs, having a minimum radius of 60 ft.

The fabricated sheets receive a shop coat of gray paint.

Curving Ferrobord — Ferrobord may be curved to minimum radius of 60 ft. 0 in. in the shop or 115 ft. 0 in. in the field.



STEELDECK FERROBORD

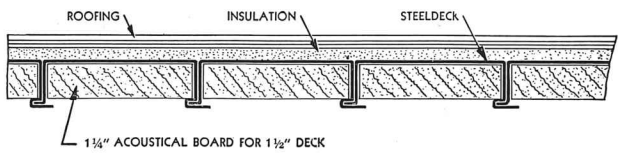
Gauge	Dimens., in.		Mom. of Inertia per ft. width	Sec. Modulus per ft. width	Table of Safe Loads in Lbs. per Sq. Ft.*											
	Depth	Width			4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″	9′-6″	10′-0″
18	1¼	6	.190	.205	154	121	97	73	56	44	35	29	.....	.....	.....	.....	.....
20	1¼	6	.148	.160	120	94	75	57	44	33	25	.....	.....	.....	.....	.....	.....
18	1½	6	.294	.268	201	159	129	106	87	69	55	45	37	.....	.....	.....	.....
20	1½	6	.228	.208	156	123	100	83	68	53	43	35	29	.....	.....	.....	.....
18	1¾	6	.425	.337	253	200	162	134	112	95	79	64	53	44	37	32	27
20	1¾	6	.329	.261	196	155	125	104	87	74	61	50	41	34	29	.....	.....

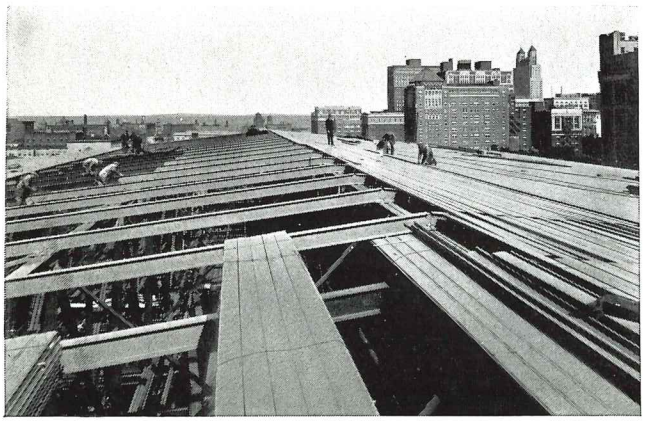
*Loads shown in above table include 5.0 lbs. dead load for deck plates, insulation and roofing.

PATENT OFFICE
JUL 15 1949
DESIGN DIVISION

FERROCOUSTIC ROOFDECKS

Ferrocoustic Roofdecks provide all the advantages of Steeldeck with the additional feature of acoustical correction for auditoriums, large rooms, gymnasiums and similar places.





FERROBORD, 6 in. wide, with acoustical treatment, consists of panels of any commercial acoustical board fitted between the ribs of these roofdecks. The flanges of the ribs form a positive mechanical support. These ribs are 1¼, 1½ and 1¾ in. deep, allowing 1, 1¼ and 1½ in. of acoustical treatment to be used. Sheets with acoustical board inserted are welded to purlins, eliminating metal clips and adding strength to the construction.

The Ferrobord construction with the Ferrocoustic treatment also makes an excellent, light-weight, quiet floor construction of minimum thickness when surfaced with cement, magnesite, rubber tile, linoleum or other materials, for its structural design enables it to carry unusually heavy loads.

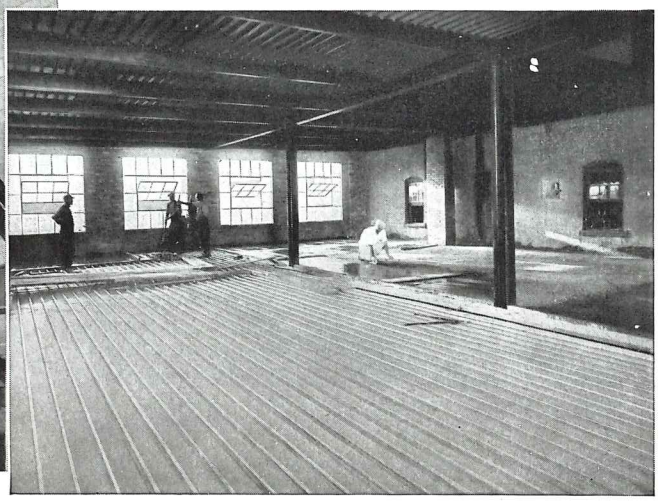
PATENT OFFICE
JUL 15 1949
DESIGN DIVISION

FERROBORD FLOOR FORMS

IN many buildings where heavy duty concrete floors are to be installed and where it is not intended to install ceilings, Truscon Ferrobord, in strips 6″ wide with 1½″ ribs, are ideal as a concrete form. Ferrobord strips are welded to structural supports with ribs up and all form work, ordinarily necessary for the floor slab is eliminated. The bottom of this type of construction, as seen from the floor below, is a smooth surface easily cleaned and preventing dropping of concrete dust.

Underside presents clean and neat appearance.

Concrete is quickly and easily poured.



SAFE LIVE LOAD TABLES (lbs. per sq. ft.)

Clear Span	20 Ga. 1½ In. Ferrobord			18 Ga. 1½ In. Ferrobord		
	3″ Slab	3½″ Slab	4″ Slab	3″ Slab	3½″ Slab	4″ Slab
3-6	540	651	769	525	643	757
4-0	468	564	666	455	557	656
4-6	412	497	586	400	490	577
5-0	353	442	523	356	437	515
5-6	285	397	471	306	392	463
6-0	233	329	427	251	355	421
6-6	193	273	361	208	296	385
7-0	160	229	305	174	249	331
7-6	135	194	259	146	211	232
8-0	114	165	221	124	180	242
8-6	97	141	190	105	153	208
9-0		121	165	89	133	180
9-6		104	142		115	156
10-0			123		99	136
10-6			107		85	119
11-0						104

Allowed Stresses
Steel .....20,000 lbs. per sq. in.
Concrete .. 800 lbs. per sq. in.
Shear ..... 40 lbs. per sq. in. n=15
Bond ..... 80 lbs. per sq. in. on perimeter of rib.
Safe loads are figured for simple, clear spans.
Negative reinforcing listed below will develop $\frac{wl^2}{24}$
Mesh will develop a negative moment of $-\frac{wl^2}{24}$ and will also provide a minimum of 0.18% temperature reinforcing.

Values above upper zigzag line are determined by shear.
Values below lower zigzag line give excessive deflection.

RETURN TO DESIGN DIV.

Negative Reinforcing and Temperature Steel

Slab	Using Bars			Using Mesh	
	Temperature Steel	Negative Reinforcing		Neg. Reif. and Temp. Steel	
		20 Ga. 1½″	18 Ga. 1½″	20 Ga. 1½″	18 Ga. 1½″
3″	⅜″ Φ @ 18″	⅜″ Φ @ 9″	⅜″ Φ @ 9″	6 x 12 1/1	6 x 12 1/1
3½″	⅜″ Φ @ 16″	⅜″ Φ @ 8½″	⅜″ Φ @ 8″	6 x 12 0/0	6 x 12 0/0
4″	⅜″ Φ @ 14″	⅜″ Φ @ 8″	⅜″ Φ @ 7½″	4 x 4 2/6	4 x 4 2/6

Maximum Spans to Support Wet Concrete (Use temporary supports under Ferrobord on longer spans)

Slab	20 Ga. 1½″	18 Ga. 1½″
3″	5′-11	6′-6
3½″	5′-9	6′-4
4″	5′-8	6′-2

STEEL DECK SPECIFICATIONS

1. **SCOPE OF WORK.** The work of this heading shall include all labor, materials, equipment, and service necessary for and reasonably incidental to the complete furnishing and installation of steel decks as shown on the drawings and as herein specified.

2. **MATERIALS.** Steel deck roof shall be fabricated from steel containing not less than two-tenths percent copper and having an ultimate tensile stress of not less than 50,000 pounds per square inch. It shall be not less than 20 U. S. Standard gauge in thickness and not less than 1¼ inches in depth.

3. **FORMED DECK.** This deck shall be formed with ribs not more than 6 inches center to center for flat top or 9 inches for cross-ribbed top, and shall be in units 6 inches to 18 inches wide. All ribs shall be an integral part of the sheet and shall be designed to meet the stress and deflection requirements hereinafter specified. Ribs shall have a flat bearing of not less than ½ inch in width and ¾ inch in length over structural supports and not less than 2 inches over masonry supports.

   The deck units shall have bearing on four supports except where the arrangement of supports makes this impossible. The sides and ends shall have an approved interlocking joint or shall lap at least 3 inches and shall splice over the supports except that sheets may be spliced between supports provided their ends are connected by means of an approved end joint capable of transmitting stress or provided lapped joints are welded to adjacent sheets throughout their whole perimeter, and provided these splices are staggered so that adjacent sheets do not splice in the same panel.

   The deck shall be attached to the supports preferably by welding, or by approved clips, each rib to each support. Welds or clips shall be capable of safely resisting an upward pull on the deck of not less than 200 pounds per connection without loosening or separating from the deck or the supports.

   Welding shall be done by experienced welders and only by the Electric Arc process.

   Welding rods shall be of the Shield Arc type and shall be General Electric rod No. W22, Lincoln Fleetweld No. W5 or approved equal.

4. **SHOP PAINTING.** All roof deck shall receive one shop coat of manufacturer's standard paint applied either by dipping or spraying. No hand-brushing will be permitted. This paint shall provide a complete coverage free from air holes. All oil, grease, or rust shall be removed before painting.

   The erection contractor after erection shall touch up all scarred surfaces on the upper and underside of the deck in an approved manner using the same paint as the shop coat.

5. **DESIGN.** All roof deck shall be capable of carrying a live load of 40 pounds per square foot uniformly distributed, or a concentration of 225 pounds applied at the center of span and distributed laterally over a distance of 18 inches as a stress not exceeding 18,000 pounds per square inch. The deflection under a 40 pound uniformly distributed load shall not exceed one two-hundred and fiftieth of the span. All spans shall be figured center to center of supports and shall be considered as simply supported. No reduction of the moment will be allowed for continuity. The moment of inertia shall be not less than .329 inches and the section modulus shall be not less than .26 inches each for one foot in width. The deflection shall be determined by calculation. Load test will not be accepted.

RETURN TO DESIGN DIV.
PATENT OFFICE
JUL 15 1949
DESIGN DIVISION

6. **OVERHANGING ROOFS.** Where overhanging roofs are shown or specified, the outside edge and the underside of the deck shall be covered with a closing plate of the same gauge as the roof deck. This may be one plate covering both ends and underside, or one plate covering the outside edge and one covering the underside of the deck provided the two plates have a suitable weather proof joint. These plates shall be of a design that provides for securely attaching the waterproofing to the steel deck. All closing plates shall be securely attached to the roof deck by means of metal screws and shall be securely anchored into the wall to provide a weather proof joint. The type of closing plate provided must be submitted to the architect for approval before using.

7. **PARAPET WALLS.** Where roof deck frames into parapet walls, skylights or other projections above the roof, backing plates of not less than 22 gauge shall be provided to connect the deck to the vertical surface, but this shall not be considered as replacing any flashing or other materials required under waterproofing and insulation specifications.

8. **INSULATION CLEATS.** When the slope of the roof exceeds 4 inches in one foot approved insulation cleats shall be provided. One cleat shall be used for each four square feet of deck. The cleats shall be of a type that is securely anchored to the roof deck without piercing the metal.

9. **ROOF BATTERS OR CRICKETS.** The roof deck is laid directly on the supporting members. Wherever it is necessary to grade or pitch the surface above the deck to provide drainage to the roof sumps, these batters or crickets shall be built up of gypsum or other approved material and are not part of the roof deck contract.

Printed in U. S. A.